AMENDMENTS TO THE CLAIMS

Please cancel claims 11-17 without prejudice or disclaimer of their underlying subject matter.

1-17 (Canceled).

Please add the following new claims.

18.(New) A method of operating a data processing system, the method comprising the steps of:

providing an expression profile of a network, said network represented by triplets having a network structure, parameters, and a degree of fitness;

generating network structures allowing said expression profile, said generated network structures being stored in a topology pool;

selecting network structures from said topology pool, adapting said parameters to said selected network structures, and computing said degrees of fitness;

storing said networks represented by triplets resulting from steps above in a triplet pool; and

screening candidate networks from said triplet pool, said screened candidate networks being stored in a candidate triplet pool.

19.(New) The method mentioned in claim 18, wherein the steps of selecting network structures and adapting said genetic parameters comprises the steps of:

selecting N network structures from said topology pool; and

adapting M parameter sets to each of said selected N network structures, said M parameter sets having the highest degree of fitness with said expression profile.

20.(New) The method mentioned in claim 19, wherein the step of adapting M parameters further comprises the step of:

estimating parameters using a process from the group consisting of a genetic algorithm and simulated annealing.

21.(New) The method mentioned in a claim 19, wherein after the step of storing networks, the method further comprises the steps of:

reorganizing network structures of N networks in the triplet pool using a process from the group consisting of a genetic algorithm and simulated annealing;

adapting parameter sets to each of said N reorganized network structures; and

storing the N × M networks in said triplet pool, each of said N × M networks having one of said M parameter sets having high degrees of fitness.

22.(New) The method mentioned in claim 21, wherein after the step of storing N × M networks, the method further comprises the steps of:

selecting P triplets having degrees of fitness at or above a predetermined threshold value from among triplets in said triplet pool, left only said P triplets in the triplet pool as a result.

23.(New) The method mentioned in claim 22, wherein after the step of selecting a P triplet, the method further comprises the steps of:

searching the vicinity of said selected P triplet; and

replacing said searched P triplets when finding a triplet of higher degree of fitness.

24.(New) The method mentioned in claim 18, wherein the step of screening candidate network comprises the steps of:

producing a mutant triplet for each triplet from said triplet pool, a mutant pool storing said mutant triplet;

evaluating a degree of fitness with a mutant profile for said mutant pool; and

integrating said degrees of fitness for said mutant pool, if a candidate group having a degree of fitness above a certain value being chosen and stored in said candidate triplet pool.

25.(New) The method mentioned in claim 24, wherein said mutant triplet is produced by eliminating a gene and removing all bonds from said gene.

26.(New) The method mentioned in claim 18, wherein the structure of said generated network structure is partially known.

4

27.(New) A computer program embodied on a computer readable medium comprising:

code means adapted to perform all the steps of claim 18 when said program is run on a data-processing system.

28.(New) A network estimation, apparatus comprising:

means for providing an expression profile of a network, said network represented by triplets having a network structure, parameters, and a degree of fitness;

means for generating network structures allowing said expression profile, said generated network structures being stored in a topology pool;

means for selecting network structures from said topology pool, adapting said parameters to said selected network structures, and computing said degrees of fitness;

means for storing said networks represented by triplets resulting from means above in a triplet pool; and

means for screening candidate networks from said triplet pool, said screened candidate networks being stored in a candidate triplet pool.